

PROJECT NUMBER: 6502
PROJECT TITLE: Environmental Tobacco Smoke
PROJECT LEADER: C. E. Thomas
PERIOD COVERED: November, 1988

I. MAINSTREAM AND SIDESTREAM SMOKE STUDIES

- A. **Objective:** Develop a method, using the tunable diode laser system (TDL), for the determination of methanol in MS and SS tobacco smoke.
- B. **Results:** The TDL system used previously to study acrolein deliveries in MS and SS tobacco smoke has been used to quantify methanol in MS smoke. The selectivity and sensitivity of the method were optimized using known amounts of methanol vapor in nitrogen. In initial tests, a monitor #25 was found to deliver approximately 250 ug/cigt. methanol in the MS smoke. A large difference was found between the methanol delivery of the first puff versus the last puff. The first puff delivered 2-4 ug while the last puff delivered about 100 ug. The limit of detection for the method is 0.1 ug/puff.
- C. **Conclusions:** A method has been developed for MS puff-by-puff methanol in cigarette smoke using TDL spectroscopy. Work on methanol deliveries of submitted samples was completed.
- D. **Plans:** Additional studies will examine the effects of cigarette blend components on methanol deliveries. The amounts of methanol in the fillers will be measured prior to lighting the cigarettes.
- E. **References:**
 1. Parrish, M., Notebook 8729, pp. 1-2.
 2. Lipscomb, J., Notebook 8703, pp. 12-19.

II. AMBIENT MONITORING OF ENVIRONMENTAL TOBACCO SMOKE

- A. **Objective:** Test and evaluate new methods and instrumentation for the measurement of environmental tobacco smoke (ETS) components and incorporate useful procedures into future ETS studies.
- B. **Results:** A recent visit was made to ACVA Atlantic Inc. in Fairfax, Va. to inspect several different instruments they use to measure indoor air quality. Of interest were an infrared CO₂ monitor and a piezobalance instrument for measuring airborne particulates. The CO₂ monitor would supplement the PASS case which currently is unable to measure carbon dioxide levels (5-50 ug/m³) of particulates. It is often used in place of collection devices for measuring RSP. More recently, Dr. Stetter, president of Transducer Research (TRI), visited PM R&D and discussed new CO sensors for use in the PASS cases. These new sensors will be less prone to drift in low humidity conditions

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such as on commercial aircraft and will have at least twice the usable lifetime. He also discussed NO₂ and SO₂ electrochemical sensors which could be easily incorporated into the PASS cases.

- C. Conclusions: The instruments used by ACVA have been used in the field very successfully and are both portable and compact. The carbon dioxide monitor was well suited for our needs and would be useful in future ETS studies. The new CO sensors from TRI should solve the problems of the CO monitors when used in aircraft.
- D. Plans: Evaluate the piezobalance method of particulates versus standard RSP measurements. This would include the recommendation to acquire a piezobalance similar to the type used by both the Environmental protection agency and ACVA Atlantic. Verify that the new sensors from TRI perform according to their specifications. Study the possibility of adding relative humidity, NO₂, and SO₂ sensors to the PASS cases.
- E. References:
 - 1. Koller, K., Notebook 8700, p. 23.
 - 2. Parrish, M., Notebook 8729, p. 2.

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